

CHAPTER FOUR

ENVIRONMENTAL CONSEQUENCES

Pursuant to Federal Aviation Administration (FAA) Order 1050.1E, Chapter 4, Paragraph 403, *Impact Categories*, and Appendix A, *Analysis of Environmental Impact Categories*, this Chapter describes the environmental impact analysis according to resource impact categories for the Proposed Action and the No Action Alternatives, which are presented as *worst-case scenarios*; any adverse environmental effects that cannot be avoided should the proposal be implemented; and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented. This chapter also describes the mitigation measures designed to mitigate unavoidable adverse environmental impacts to a less-than-significant level, if required:

- Air Quality
- Coastal Resources
- Compatible Land Use
- Construction Impacts
- Department of Transportation Act, Section 4(f)
- Farmlands
- Fish, Wildlife, and Plants
- Floodplains
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Historical, Architectural, Archeological, and Cultural Resources
- Light Emissions and Visual Impacts
- Natural Resources and Energy Supply
- Noise
- Secondary (Induced) Impacts
- Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks
- Water Quality
- Wetlands
- Wild and Scenic Rivers

4.1 EVALUATION OF ENVIRONMENTAL CONSEQUENCES

Since the majority of the proposed modification to the Four Corner-Post Plan (the Proposed Action) involves aircraft route changes at altitudes above 3,000 feet, and does not involve any physical construction activities, many of the resources described in the categories listed above would not be affected. For example, the Proposed Action would not impact environmental factors relating to the physical environment (water quality, fish, wildlife, and plants, wetlands, floodplains, coastal zone management, coastal barriers, wild and scenic rivers, or farmlands). Likewise, the Proposed Action does not have any physical construction issues, so construction impacts (for example, energy supply and natural resources, light emissions, solid waste, or construction) are not necessary to evaluate. **Table 4.8** provides a summary matrix of the potential impacts for each environmental resource category.

4.1.1 Resource Impact Categories Unaffected by the Proposed Action

As previously stated in **Section 4.1** of this chapter, due to the altitude of the air traffic route changes, and because there will be no land based construction activities, the existing environment and the resources within the following environmental resource impact categories would be unaffected by the Proposed Action and will not be evaluated. See **Sections 4.1.1.1 through 4.1.1.15** for more detailed information about each unaffected resource impact category. **Table 4.8** provides a summary matrix of the potential impacts for each environmental resource category.

- Air Quality
- Coastal Resources
- Compatible Land Use
- Construction Impacts
- Farmlands
- Fish, Wildlife, and Plants
- Floodplains
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Light Emissions
- Natural Resources and Energy Supply
- Secondary (Induced) Impacts
- Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks
- Water Quality
- Wetlands
- Wild and Scenic Rivers

4.1.1.1 Air Quality

FAA Order 1050.1E, Appendix A, Section 2, *Air Quality*, states that potential air quality impacts of a proposed federal action be evaluated pursuant to the *Clean Air Act (CAA)* and the *National Environmental Policy Act (NEPA)*, which are each unique legislative acts that require distinct analyses for air impacts and are separately applicable to federal projects. Airport actions are subject to the general conformity regulations of the CAA when the project area is designated by the U.S. Environmental Protection Agency (USEPA) as nonattainment for one or more of the pollutants regulated under the National Ambient Air Quality Standards (NAAQS). However, when the Proposed Action is also exempt, conformity regulations would not apply.

Clark County, Nevada, which encompasses the entire Study Area for the Proposed Action, has been designated nonattainment for carbon monoxide (CO), particulate matter (PM₁₀, particles less than 10 micrometers in diameter), and ozone (O₃). However, the Proposed Action at Las Vegas-McCarran International Airport (LAS) is exempt from the requirements of general conformity as defined in the preamble to the *General Conformity Rule* at 58 FR 63229 (11/30/93). Consequently, no analysis is required for the Proposed Action under the CAA conformity regulations.

The CAA also specifies that regardless of the applicability of general conformity, the emissions due to a Federal action cannot exceed the emissions budget allocated in the State Implementation Plan (SIP). Airport actions that are limited to modifications to departure procedures would not cause additional emissions. Therefore, an analysis to demonstrate that project emissions from the Proposed Action comply with the SIP emissions budget would not be applicable.

Proposed Actions at airports that service more than 2.6 million annual passengers require an evaluation of airport-related emissions and the comparison of project emissions to the NAAQS (which requires that a dispersion analysis be conducted). However, Proposed Actions that are excluded do not require an NAAQS evaluation, regardless of the number of annual passengers. Although LAS services more than 40 million passengers each year, the Proposed Action is defined as exempt under FAA Order 1050.1E, Section 303b. Consequently, a NAAQS comparison analysis is not required.

Some states require a review of indirect sources of emissions when a Proposed Action at an airport includes an increase in annual aircraft operations or passengers. The State of Nevada is not included in the list of nine states that currently require such an Indirect Source Review.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

The Proposed Action is exempt from the general conformity regulations and would not be required to show compliance to the State Implementation Plan (SIP). In addition, the Proposed Action is excluded under FAA guidelines and would not be required to show compliance to the National Ambient Air Quality Standards (NAAQS). Consequently, emissions from the Proposed Action would be considered insignificant with regard to potential air quality impacts; and other than documenting the relevant regulations, no analysis or further reporting regarding air quality impacts is required.

4.1.1.2 Coastal Resources

FAA Order 1050.1E, Appendix A, Section 3, *Coastal Resources*, states that federal activities involving or affecting coastal resources are governed by the *Coastal Barriers Resources Act (CBRA)*, the *Coastal Zone Management Act (CZMA)*, and Executive Order 13089, *Coral Reef Protection*. The CBRA prohibits, with some exceptions, federal financial assistance for development within the Coastal Barrier Resources System that contains undeveloped coastal barriers along the Atlantic and Gulf coasts and Great Lakes. The CZMA and the National Oceanic and Atmospheric Administration (NOAA) implementing regulations (15 CFR part 930) provide procedures for ensuring that a proposed action is consistent with approved coastal zone management programs. Executive Order 13089, *Coral Reef Protection*, requires federal agencies to ensure that any actions that they authorize, fund, or carry out will not degrade the conditions of coral reef ecosystems.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

No coastal zone management areas or coastal barriers have been identified within the Study Area for the Proposed Action. Therefore, with implementation of the Proposed Action, no ground disturbing activities are proposed and no coordination under the *Coastal Barriers Resources Act (CBRA)*, the *Coastal Zone Management Act (CZMA)*, or Executive Order 13089, *Coral Reef Protection*, is required.

4.1.1.3 Compatible Land Use

FAA Order 1050.1E, Appendix A, Section 4, *Compatible Land Use*, states that "...the compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport. Airport development actions to accommodate fleet mix changes or the number of aircraft operations, air traffic changes, or new approaches made possible by new navigational aids are examples of activities that can alter aviation-related noise

impacts and affect land uses subjected to those impacts. In this context, if the noise analysis described in the noise analysis section concludes that there is no significant impact, a similar conclusion usually may be drawn with respect to compatible land use. However, if the proposal would result in other impacts exceeding thresholds of significance which have land-use ramifications, the effects on land use shall be analyzed in this context and described accordingly under the appropriate impact category..."

The purpose of considering noise in the land use planning process is not to prevent development, but rather to encourage development that is compatible with various noise levels. The objective is to guide noise sensitive land uses away from the noise source and encourage non-sensitive land uses where there is noise.

The FAA adopted land use compatibility guidelines when it promulgated Federal Aviation Regulations (FAR) Part 150, *Airport Noise Compatibility Planning*. The FAR Part 150 land use compatibility guidelines are most often used in airport noise studies as the basis for determinations of land use compatibility made in federal Environmental Assessments and Environmental Impact Statements. Compatibility with noise-sensitive land uses are defined in **Appendix B, Supporting Information for Noise Analysis**.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

The noise analysis described in **Section 4.2, Noise**, of this chapter concluded that the Proposed Action does not exceed the thresholds for a significant impact on noise-sensitive land use. Thus, the Proposed Action is considered to have no adverse impact on noise-sensitive land uses and no analysis will be conducted for land use compatibility issues.

4.1.1.4 Construction Impacts

FAA Order 1050.1E, Appendix A, Section 5, *Construction Impacts*, states that Local, State, Tribal, or Federal ordinances and regulations address the impacts of construction activities, including construction noise, dust and noise from heavy equipment traffic, disposal of construction debris, and air and water pollution.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

The Proposed Action consists of changes in flight patterns and would not result in the construction or demolition of new or existing on-ground facilities. Therefore, there are no potential construction impacts to evaluate. Further, implementation of the Proposed Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

4.1.1.5 Farmlands

FAA Order 1050.1E, Appendix A, Section 7, *Farmlands*, states that the *Farmland Protection Policy Act (FPPA)* regulates federal actions with the potential to convert farmland to non-agricultural uses.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Implementation of the Proposed Action would not result in land acquisition or construction activities that would take or alter the use of existing farmed land. Therefore, the Proposed Action would have no affect on farmland and coordination under the *Farmland Protection Policy Act* is not required.

4.1.1.6 Fish, Wildlife, and Plants

FAA Order 1050.1E, Appendix A, Section 8, *Fish, Wildlife, and Plants*, states that "...Section 7 of the *Endangered Species Act (ESA)*, as amended, applies to Federal agency actions and sets forth requirements for consultation to determine if the proposed action may affect an endangered or threatened species. If an agency determines that an action may affect a threatened or endangered species, then Section 7(a)(2) requires the lead agency, to consult with the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS), as appropriate, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally listed endangered or threatened species or result in the destruction or adverse modification of critical habitat."

Coordination regarding the Proposed Action took place with the U.S. Fish and Wildlife Service, the Nevada Department of Wildlife, and the State of Nevada Department of Conservation and Natural Resources. As shown in Appendix D, Agency Coordination, each of these agencies received a letter and document describing the Proposed Project, as well as a request for the agency's input regarding known federally or state-listed species within the Study Area.

In a response letter to the FAA, dated October 4, 2005, the U.S. Fish and Wildlife Service stated that "...no (federally) listed, proposed, or candidate species occur in the subject project area."¹

In a response dated August 29, 2005, the Nevada Department of Wildlife stated that "Should installation of new structures be unnecessary to effect Four Corner Post Plan modifications, we do not anticipate any direct, indirect, or cumulative impacts to wildlife or habitats."²

The Nevada Department of Conservation and Natural Resources, Nevada Natural Heritage Program (NNHP) provided data regarding state-listed species with known habitats within the Study Area for the Proposed Action. As previously discussed in **Section 3.5, Biological and Natural Resources**, of this document, the NNHP provided a list of State of Nevada protected, sensitive, at-risk, and watch-list species with known habitats located within the Study Area for the Proposed Action. There are no federal or state-listed threatened or endangered species with known habitats located within the Study Area for the Proposed Action.³

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Implementation of the Proposed Action would not result in land acquisition or construction activities that would change existing land cover patterns, remove or alter terrestrial or aquatic habitats, or result in jeopardizing the continued existence of federal or state-listed threatened or endangered species and/or their respective critical habitats. Therefore, further consultation under the *Endangered Species Act (ESA)* is not required.

4.1.1.7 Floodplains

FAA Order 1050.1E, Appendix A, Section 9, *Floodplains*, states that Executive Order 11988, *Floodplain Management*, directs federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains. Department of Transportation (DOT) Order 5650.2, *Floodplain Management and Protection*, contains DOT's policies and procedures for

¹ Correspondence from Robert D. Williams, Field Supervisor, U.S. Fish and Wildlife Service, Nevada Fish and Wildlife Office, dated October 4, 2005. See **Appendix D**.

² Correspondence from Roddy Shepard, Habitat Biologist, Nevada Department of Wildlife, Southern Region, dated August 29, 2005. See **Appendix D**.

³ Nevada Department of Conservation and Natural Resources, Nevada Natural Heritage Program (NNHP), GIS data provided September 2005. Additional data from NNHP retrieved September 27, 2005, on-line at <http://www.heritage.nv.gov/>. See **Appendix D**.

implementing Executive Order 11988. Agencies are required to make a finding that there is no practicable alternative before taking action that would encroach on a base floodplain based on a 100-year flood (7 CFR 650.25).

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Implementation of the Proposed Action would not result in land acquisition or construction activities and no floodplains would be affected, therefore there are no potential impacts to evaluate and *Executive Order 11988, Floodplain Management*, and DOT Order 5650.2, *Floodplain Management and Protection*, do not apply to the Proposed Action.

4.1.1.8 Hazardous Materials, Pollution Prevention, and Solid Waste

FAA Order 1050.1E, Appendix A, Section 10, *Hazardous Materials, Pollution Prevention, and Solid Waste*, states that the *Resource Conservation and Recovery Act (RCRA)* (as amended by the *Federal Facilities Compliance Act of 1992*) governs the generation, treatment, storage, and disposal of hazardous wastes; the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*, as amended by the *Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund)* and the *Community Environmental Response Facilitation Act of 1992* provide for consultation with natural resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment. Executive Order 12088, *Federal Compliance with Pollution Control Standards*, as amended, directs federal agencies to: comply with “applicable pollution control standards,” in the prevention, control, and abatement of environmental pollution; and consult with the Environmental Protection Agency (USEPA), State, interstate, and local agencies concerning the best techniques and methods available for the prevention, control, and abatement of environmental pollution. Consideration of these regulations in evaluating the effects of proposed actions should begin with an understanding of the following three terms:

- *Hazardous Material* – any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce (49 CFR part 172, table 172.101). This includes hazardous substances and hazardous wastes.
- *Hazardous Waste* – under the *Resource Conservation and Recovery Act (RCRA)* a waste is considered hazardous if it is listed in, or meets the characteristics described in 40 CFR part 261, including ignitability, corrosivity, reactivity, or toxicity.
- *Hazardous Substance* – any element, compound, mixture, solution, or substance defined as a hazardous substance under the *Comprehensive*

Environmental Response, Compensation, and Liability Act (CERCLA) and listed in 40 CFR part 302. If released into the environment, hazardous substances may pose substantial harm to human health or the environment.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Implementation of the Proposed Action would not affect the amount of solid waste generated by LAS nor would it necessitate additional waste disposal means or locations. In addition, implementation of the Proposed Action would not affect the current management plans for hazardous materials or pollution prevention at LAS. Therefore, there are no potential impacts of the Proposed Action on hazardous materials, pollution prevention, or solid waste to evaluate and coordination under the *Resource Conservation and Recovery Act* (as amended), the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* (as amended), the *Community Environmental Response Facilitation Act*, and Executive Order 12088, *Federal Compliance with Pollution Control Standards* (as amended) is not required.

4.1.1.9 Light Emissions

FAA Order 1050.1E, Appendix A, Section 12, *Light Emissions and Visual Impacts*, states that, regarding light emissions, an environmental assessment shall consider "...the extent to which any lighting associated with an action will create an annoyance among people in the vicinity or interfere with their normal activities. Because of the relatively low levels of light intensity compared to background levels associated with most air navigation facilities (NAVAIDS) and other airport development actions, light emissions impacts are unlikely to have an adverse impact on human activity or the use or characteristics of the protected properties."

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Because there are already existing flight patterns established over the Study Area and implementation of the Proposed Action would not result in a change in lighting equipment or configuration at LAS, therefore, no potential impacts of light emissions to evaluate.

See **Section 4.5, Visual Impacts**, for an evaluation of the potential visual impacts of the Proposed Action.

4.1.1.10 Energy Supply and Natural Resources

FAA Order 1050.1E, Appendix A, Section 13, *Energy Supply and Natural Resources*, states that Executive Order 13123, *Greening the Government through Efficient Energy Management* (64 FR 30851, June 8, 1999), encourages each federal agency to expand the use of renewable energy within its facilities and in its activities. Executive Order 13123 also requires each federal agency to reduce petroleum use, total energy use and associated air emissions, and water consumption in its facilities. It is also the policy of the FAA, consistent with the Environmental Protection Agency (USEPA) and the Council on Environmental Quality (CEQ), to encourage the development of facilities that exemplify the highest standards of design including principles of sustainability so that all elements of the transportation system be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the traveling public.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Because the implementation of the Proposed Action consists of changes in flight patterns that would decrease fuel usage by aircraft with the right-turn for eastbound departures from Runway 25 at LAS, and would not result in the construction or demolition of new or existing on-ground facilities, no increase in energy supply or construction materials would be required, and Executive Order 13123 is not applicable.

4.1.1.11 Secondary (Induced) Impacts

FAA Order 1050.1E, Appendix A, Section 15, *Secondary (Induced) Impacts*, states that shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity to the extent influenced by major airport development proposals often involve the potential for induced or secondary impacts on surrounding communities.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Because the implementation of the Proposed Action consists of changes in flight patterns and would not result in the construction or demolition of new or existing on-ground facilities, the Proposed Action would not cause shifts in patterns of population movement and growth, public service demands, or change in business and economic activity. Therefore, there are no secondary (induced) impacts to evaluate.

4.1.1.12 Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks

FAA Order 1050.1E, Appendix A, Section 16, states the following regarding potential socioeconomic impacts, environmental justice concerns, and children's environmental health and safety risks:

Socioeconomic Impacts

Factors to be considered in determining the potential socioeconomic impacts include, but are not limited to, the following:

- Extensive relocation of residents without the availability of sufficient replacement housing;
- Extensive relocation of community businesses that would create severe economic hardship for the affected communities;
- Disruptions of local traffic patterns that would substantially reduce the levels of service of the roads serving the airport and its surrounding communities;
- A substantial loss in community tax base.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Implementation of the Proposed Action consists of changes in flight patterns and would not result in the construction or demolition of new or existing on-ground facilities, would require no property acquisition or relocation of residents or businesses, nor would it disrupt local traffic patterns or create substantial losses in

the community tax base. Therefore, there are no potential socioeconomic impacts of the Proposed Action to evaluate.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* requires all federal agencies to identify and address disproportionate and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Executive Order also directs federal agencies to incorporate environmental justice into their overall missions by conducting their programs and activities in a manner that provides minority and low-income populations an opportunity to participate in agency programs and activities.

Executive Order 12898 relates to requirements in Title VI of the *Civil Rights Act of 1964* (Title VI), the *National Environmental Policy Act (NEPA)*, the *Uniform Relocation Assistance and Real Property Acquisition Act* (49 CFR Part 24), and other applicable statutes and regulations. Title VI of the *Civil Rights Act of 1964* provides that no person will, on the grounds of race, color, religion, sex, national origin, marital status, disability, or family composition, be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program of the federal, state, or local government. Title VIII of the *1968 Civil Rights Act* guarantees each person equal opportunity in housing.

U.S. Department of Transportation (DOT) Order 5610.2, *Environmental Justice in Minority Populations and Low-Income Populations*, was issued to implement the President's Executive Order 12898.⁴ DOT Order 5610.2 defines minorities as people who are Black, Hispanic, Asian American, American Indian, or Alaskan Native. Minority populations are defined as "any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity." The DOT Order defines a low-income population as "any readily identifiable group" of persons whose median household income is at or below the poverty guidelines of the U.S. Department of Health and Human Services, "who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed USDOT program, policy or activity."

In determining whether a proposed project or activity is in compliance with Executive Order 12898, two factors must be considered. The first is whether the proposal is likely to have adverse effects on minority or low-income populations. The second is to determine whether the adverse impacts are disproportionately high on minority or low-income populations. The DOT Order defines "adverse effects" as "...the totality of significant individual or cumulative human health or

⁴ 62 CFR 72, *Department of Transportation Order to Address Environmental Justice in Minority Populations and Low-Income Populations*.

environmental effects, including interrelated social and economic effects..." The DOT Order defines "disproportionately high and adverse effects" as those that are "predominately borne by a minority population and/or a low-income population, or will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population."

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

In response to Executive Order 12898, implementation of the Proposed Action would not acquire land, displace people, or disproportionately increase noise impacts upon low-income or minority populations than it might upon non-minority populations and/or non-low-income populations, according to the 2000 Census data discussed in **Section 3.9, Socioeconomic Profile**, and shown in **Exhibits 3.14, 3.15, and 3.16** of this document.

Children's Environmental Health and Safety Risks

Pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

In response to Executive Order 13045, implementation of the Proposed Action would not create environmental health risks or safety risks for any persons, regardless of age. Therefore, there are no potential children's environmental health and safety risks to evaluate.

4.1.1.13 Water Quality

FAA Order 1050.1E, Appendix A, Section 17, *Water Quality*, states that the *Federal Water Pollution Control Act*, as amended (commonly referred to as the *Clean Water Act*), provides the authority to establish water quality standards, control discharges,

develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, and regulate other issues concerning water quality. The *Fish and Wildlife Coordination Act* also applies if a proposed federal action would impound an area greater than 10 acres, or divert, drain, control, or otherwise modify the waters of any stream or other body of water. The Environmental Protection Agency (USEPA) must be conferred with if there is the potential for contamination of an aquifer designated as a sole or principal drinking water resource for the area, as required by section 1424(e) of the *Safe Drinking Water Act*, as amended.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Because the implementation of the Proposed Action consists of changes in flight patterns and would not result in land acquisition, construction, or demolition of new or existing on-ground facilities, no surface or ground water resources including aquifers, wetlands, streams, rivers, or floodplains would be affected by the Proposed Action. The coordination requirements under the *Federal Water Pollution Control Act* and the *Fish and Wildlife Coordination Act* do not apply to the Proposed Action.

4.1.1.14 Wetlands

FAA Order 1050.1E, Appendix A, Section 18, *Wetlands*, states that Executive Order 11990, *Protection of Wetlands*, Department of Transportation (DOT) Order 5660.1A, *Preservation of the Nation's Wetlands*, the *Rivers and Harbors Act of 1899*, and the *Clean Water Act* address activities in wetlands. Executive Order 11990 requires federal agencies to ensure their actions minimize the destruction, loss, or degradation of wetlands and also assures the protection, preservation, and enhancement of the Nation's wetlands to the fullest extent practicable during the planning, construction, funding, and operation of transportation facilities and projects. DOT Order 5660.1A sets forth DOT policy that transportation facilities should be planned, constructed, and operated to assure protection and enhancement of wetlands.

As stated in FAA Order 1050.1E, Appendix A, Section 18, *Wetlands*, a significant impact on a wetland area would occur when a proposed action would result in any of the following:

- Adversely affect the function of a wetland to protect the quality or quantity of municipal water supplies, including sole source, potable water aquifers;
- Substantially alter the hydrology needed to sustain the functions and values of the affected wetland or any wetlands to which it is connected;

- Substantially reduce the affected wetland's ability to retain floodwaters or storm-associated runoff, thereby threatening public health, safety or welfare (this includes cultural, recreational, and scientific resources important to the public, or property);
- Adversely affect the maintenance of natural systems that support wildlife and fish habitat or economically-important timber, food, or fiber resources in the affected or surrounding wetlands;
- Promote development of secondary activities or services that would affect the above-mentioned resources;
- Be inconsistent with applicable State wetland strategies.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Because the implementation of the Proposed Action consists of changes in flight patterns and would not result in land acquisition, construction, or demolition of new or existing on-ground facilities, implementation of the Proposed Action would not impact wetland areas and does not meet any of the above-listed criteria. Therefore, coordination under Executive Order 11990, *Protection of Wetlands*, Department of Transportation (DOT) Order 5660.1A, *Preservation of the Nation's Wetlands*, the *Rivers and Harbors Act of 1899*, and the *Clean Water Act* is not required.

4.1.1.15 Wild and Scenic Rivers

FAA Order 1050.1E, Appendix A, Section 19, *Wild and Scenic Rivers*, states that the *Wild and Scenic Rivers Act*, as amended, describes those river segments designated or eligible to be included in the Wild and Scenic Rivers System. The President's *1979 Environmental Message Directive on Wild and Scenic Rivers* (August 2, 1979) directs federal agencies to avoid or mitigate adverse effects on rivers identified in the Nationwide Rivers Inventory as having potential for designation under the Wild and Scenic Rivers Act. The August 11, 1980 Council on Environmental Quality Memorandum on *Procedures for Interagency Consultation* requires Federal agencies to consult with the National Park Service when proposals may affect a river segment included in the Nationwide Rivers Inventory.

No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

Proposed Action

Because the implementation of the Proposed Action consists of changes in flight patterns and would not result in land acquisition, construction, or demolition of new or existing on-ground facilities, coordination under the *Wild and Scenic Rivers Act of 1968* is not required. Further, as previously described in **Section 3.5.2.2, Wild and Scenic Rivers**, of this document, no designated Wild and Scenic Rivers or rivers with the potential for designation have been identified within the Study Area for the Proposed Action.

4.1.2 Potential Resource Impact Categories

The proposed departure procedure modification (the Proposed Action) has the potential to impact the following resource categories.

- Noise
- Department of Transportation Act, Section 4(f)
- Historic, Architectural, Archeological, and Cultural
- Visual

Sections 4.2 through 4.5 of this chapter provide detailed information regarding the potential impacts of the Proposed Action (presented as *worst-case scenarios*) and the No Action Alternative as related to the above-listed resource impact categories. **Table 4.8** provides a summary matrix of the potential impacts for each environmental resource category.

4.2 NOISE

Aircraft noise is often the most noticeable environmental effect associated with an aviation project. This section will evaluate the environmental impact of cumulative noise energy exposure on individuals as a result of aviation operations for the Proposed Action and the No Action Alternative. This noise energy exposure is expressed in terms of yearly day/night average sound level (DNL).

FAA Order 1050.1E, Appendix A, Section 14, *Noise*, states that the FAA has determined that a *significant* noise impact would occur if a detailed noise analysis indicates that a proposed project results in an increase within the DNL 65 Decibel (dB) contour of 1.5 dB or greater on any noise sensitive area. If this were to occur, the FAA must provide mitigation measures to reduce this to a less than significant level, or if unattainable, suspend the Environmental Assessment (EA) analysis and conduct an Environmental Impact Statement (EIS).

4.2.1 Noise Analysis Methodology

Aircraft noise level evaluations for this SEA were developed using the Integrated Noise Model, Version 6.1. The model was used to compute noise at locations surrounding LAS resulting from the departure procedure that is proposed for this project.

The Day-Night Sound Level (DNL) methodology was developed by the Environmental Protection Agency to describe the cumulative impact of noise exposure on residential areas.⁵ DNL methodology combines the loudness and length of time each aircraft noise event is heard with the number of events and time of day that the operations occur. Those operations that occur between the hours of 10:00 p.m. and 6:59 a.m. are assessed a ten decibel penalty that equates to each event being considered to have ten times as much noise energy as it would have during the daytime hours. Consequently, an area exposed to large numbers of events at night would have a disproportionately larger noise contour than an area without many night events, even though the total number of operations might be equal. The penalty is assessed in recognition of the greater sensitivity of residential uses to noise that occurs at night and to the generally quieter ambient noise levels that occur during those hours.

Because the Proposed Action deals with airspace routing changes at altitudes above 3,000 feet Above Ground Level (AGL), the noise evaluations in this study consider the potential noise level effect of approaching and departing aircraft to an altitude of 10,000 feet AGL. The controlling characteristic in noise level evaluation for high-altitude assessments is the cumulative noise level to which an area is, or may become, exposed by changes to airspace utilization.

FAA guidelines provided in FAA Order 1050.1E, Appendix A, Section 14, *Noise*, state that any noise sensitive area exposed to a noise level increase of 1.5 decibels of DNL or more that falls within the 65 DNL contour of the proposed action condition is considered to be *significantly* impacted by the change. Furthermore, if that condition occurs, any area within the 60 to 65 DNL contour band of the Proposed Action and exposed to an increase of 3 decibels of DNL or more by the change must be reported. Finally, any area exposed to an increase of 5 decibels or more of DNL and is exposed to a cumulative level of 45 to 60 DNL or more by the Proposed Action must also be reported.

This section will indicate the areas exposed to each of the three categories of noise level increase that are, under federal guidance, to be reported. Because the Proposed Action deals solely with operations taking place under Instrument Flight Rules (IFR), the noise modeling effort focuses on these operations. Visual Flight Rule (VFR) traffic using local flight patterns is not expected to change for either the future No Action or Proposed Action scenarios. Since this type of traffic is very

⁵ The DNL metric utilizes A-Weighted Sound (dBA), which is a system for measuring sound energy that is designed to represent the response of the human ear to sound; it depresses noise levels in low and high frequency bands, approximately the frequency response of the human ear.

difficult to model due to a lack of detailed data (radar flight tracks etc.) it is typically considered through the use of field noise measurements. **Appendix B, Supporting Information for Noise Analysis** presents detailed information regarding the field noise measurements undertaken for this study and their results. Similarly, the operations and traffic patterns at North Las Vegas Airport and Nellis Air Force Base are not expected to change as a result of the Proposed Action. Thus, the noise levels associated with these facilities have been evaluated qualitatively with regard to their contribution to the noise from LAS, north of the airport. Again, this evaluation is presented in **Appendix B** as it does not materially affect the consideration of the noise changes associated with the Proposed Action.

Noise level changes between the proposed air traffic procedures and the current procedures will be reflected by the differences between *before* and *after* noise levels plotted on the various exhibits in this section. Noise levels for year 2004 (current traffic level), 2005 (traffic level at procedure implementation), and 2010 (future traffic level) conditions are projected.

In addition to the DNL analysis contained in this Section, other supplemental noise monitoring and ambient noise background information is contained in **Appendix B**. This additional information is provided to assist in understanding general noise conditions as they relate to existing ambient noise levels and the potential for change to the ambient levels caused by the Proposed Action.

4.2.1.1 INM Program Input

A variety of user-supplied information is required to accurately run the Integrated Noise Model (INM) to compute aircraft noise levels in the airport environs and along the routes of flight leading to and from the airport. In the case of this Proposed Action, noise levels were computed for operations associated only with LAS. Over 542,000 operations occurred at LAS in 2004, including a mixture of domestic and international passenger traffic, cargo operations, and substantial general aviation activity.⁶

The INM requires that airport runways and flight tracks be defined through a system of geographic coordinates and that the volume of traffic using the airport be distributed among them. This distribution is divided among numerous aircraft types and the time of day at which they operate.

For this analysis, input data was developed from the following four sources:

1. Forecast information supplied by Clark County Aviation Department for year 2004, 2005, and 2010 operations.
2. Fleet Mix information supplied by Clark County Aviation Department for year 2004, 2005, and 2010 operations.
3. Runway Use information supplied by Clark County Aviation Department for 2004.

⁶ Clark County Department of Aviation, 2005.

4. Radar Data provided by FAA's Air Traffic (AT) Labs. A sample of radar data for traffic at LAS was taken from FAA's AT Labs archive. The sample included 15 days of traffic at LAS from 2004 and 2005. The sample days were spread from mid-2004 to April of 2005 to accommodate seasonal variations and to capture the most recent flight routings. The data included some 20,994 flight tracks that were used to develop modeled flight tracks and day-night distributions.

4.2.1.2 Activity Data

For this analysis, the number of daily operations for the year 2004 and forecast years 2005 and 2010 were derived from forecast data provided by the Clark County Department of Aviation (CCDOA) in September 2005. This forecast information includes total average daily operations, distributed among general categories of user and detailed fleet mix.

The average number of daily operations was derived by dividing the annual operations, as reported in the forecasts, by 365. **Table 4.1** provides a summary of the annual and annual average daily operations used in this assessment to project noise levels for each facility in the years 2004, 2005 and 2010.

The computations indicate that LAS experienced an estimated average of 743 operations each day during 2004. In the year 2005, the total number of operations is forecast to grow by approximately 2 percent to exceed 553,000 annual operations or 758 on an annual average day. By 2010, operations are expected to grow approximately 13.5 percent over the 2005 levels with approximately 628,000 annual operations or 860 on an annual average day.

Table 4.1
CURRENT AND FORECAST ANNUAL OPERATIONS

Facility	Annual Operations			Operations Per Annual Average Day		
	2004	2005	2010	2004	2005	2010
McCarran International Airport	542,217	553,188	628,008	742.80	757.82	860.31

Source: Clark County Department of Aviation, September 2005.

4.2.1.3 Fleet Mix

The distribution of the operations among the many types of aircraft available within the INM is a second critical component of the INM input data. The distribution among types for this analysis was based on the distribution of aircraft provided by the Clark County Department of Aviation forecasts discussed above. The average daily operations by aircraft type for LAS is presented in **Table 4.2**.

Table 4.2
AVERAGE DAILY OPERATIONS BY AIRCRAFT TYPE (FLEET MIX)

INM Type	Typical Aircraft	2004	2005	2010
Scheduled Air Carrier and Commuter				
<i>Heavy (more than 200 seats)</i>				
747400	Boeing 747 all series	2	3	5
767300	Boeing 767 all series	17	18	24
777300	Boeing 777 all series	0	0	2
777200	Boeing 7E7, 787	0	1	4
A310	Airbus A310 all series, A300's, A330's, A340's	5	5	5
DC1030	McDonnell Douglas DC-10's, MD11's, and L1011's	3	3	1
<i>Medium (150 Seats to 200 Seats)</i>				
737800	Boeing 737-800/900's	33	33	36
727EM2	Boeing 727's all series w/Hushkits	12	11	6
757RR	Boeing 757's all series	146	149	166
A320	Airbus A320 & A321's	161	165	190
MD9028	McDonnell Douglas MD-90's all series	6	6	6
<i>Small (50-149 seats)</i>				
737300	Boeing 737-300's	258	265	311
737400	Boeing 737-400's	6	6	3
737500	Boeing 737-500's	17	16	10
737700	Boeing 737-700's	165	173	221
717200	Boeing 717's	4	4	6
737N17	Boeing 737-100/200's w/Hushkits	35	31	11
A319	Airbus A318 & A319's	47	50	69
DC93LW	McDonnell Douglas DC-9's all series w/Hushkits	2	2	3
GV	CR7, CR9, E170, E190	21	24	42
MD83	McDonnell Douglas MD-80's all series	58	58	63
<i>Commuter (Less than 50 seats)</i>				
DHC6	Large Twin Turboprops	0	0	0
EMB120	Embraer 120's	11	11	9
EMB145	CRJ-200, E135, E145	18	18	18
Helicopters				
AS350	Helicopters (Strip + Canyon)	243	244	252
General Aviation & Military				
BEC58P	Twin Piston Prop (Beech Baron)	39	42	62
CNA441	Twin Turboprop (King Air)	13	14	18
LEAR25	Med./Sm. Stage 2 Bizjet (LR24, LR25)	9	10	11
F-18	Military Jets (F18, F16)	1	1	1
GASEPV	Single Engine Prop (C172)	40	42	53
GIIB	Large Stage 2 Bizjet (GII, GIII, Sabr)	8	8	7
GIV	Large Stage 3 Bizjet (GV)	44	43	41
LEAR35	Med./Sm. Stage 3 Bizjet (LR35)	62	63	67
TOTAL		1,486	1,516	1,721

Sources: Clark County Department of Aviation, September 2005. Landrum & Brown Analysis, 2005.

4.2.1.4 Time-of-Day

The time of day that operations occur is a third critical component of the INM input. It is important to the computation of the cumulative average noise level because a penalty of ten decibels is assigned to each operation that occurs between the hours of 10:00 p.m. and 6:59 a.m. The distribution between day and night was developed for each individual aircraft type and operation type from the LAS radar sample acquired for this analysis. On an average day in 2004, approximately 15 percent of aviation traffic operating at LAS took place during nighttime hours (10:00 p.m. to 6:59 a.m.). The Day-Night splits that were developed from the radar data sample were used for the current 2004 conditions, as well as for the future 2005 and 2010 conditions. **Table 4.3** presents the Day-Night percentages used for noise modeling for each aircraft type in the LAS fleet.

Table 4.3
DAY-NIGHT PERCENTAGES BY AIRCRAFT TYPE

INM Type	Typical Aircraft	ARRIVALS		DEPARTURES	
Scheduled Air Carrier and Commuter		Day %	Ngt %	Day %	Ngt %
<i>Heavy (more than 200 seats)</i>					
747400	Boeing 747 all series	100.0%	0.0%	100.0%	0.0%
767300	Boeing 767 all series	84.6%	15.4%	80.5%	19.5%
777300	Boeing 777 all series	84.6%	15.4%	80.5%	19.5%
777200	Boeing 7E7, 787	84.6%	15.4%	80.5%	19.5%
A310	Airbus A310 all series, A300's, A330's, A340's	43.8%	56.3%	89.2%	10.8%
DC1030	McDonnell Douglas DC-10's, MD11's, and L1011's	71.4%	28.6%	100.0%	0.0%
<i>Medium (150 Seats to 200 Seats)</i>					
737800	Boeing 737-800/900's	73.8%	26.2%	75.7%	24.3%
727EM2	Boeing 727's all series w/Hushkits	79.2%	20.8%	86.9%	13.1%
757RR	Boeing 757's all series	74.5%	25.5%	72.4%	27.6%
A320	Airbus A320 & A321's	69.0%	31.0%	69.9%	30.1%
MD9028	McDonnell Douglas MD-90's all series	87.1%	12.9%	87.1%	12.9%
<i>Small (50-149 seats)</i>					
737300	Boeing 737-300's	85.3%	14.7%	86.3%	13.7%
737400	Boeing 737-400's	64.2%	35.8%	82.5%	17.5%
737500	Boeing 737-500's	92.8%	7.2%	92.9%	7.1%
737700	Boeing 737-700's	87.4%	12.6%	88.2%	11.8%
717200	Boeing 717's	80.7%	19.3%	82.9%	17.1%
737N17	Boeing 737-100/200's w/Hushkits	91.4%	8.6%	79.8%	20.2%
A319	Airbus A318 & A319's	63.7%	36.3%	63.8%	36.2%
DC93LW	McDonnell Douglas DC-9's, all series w/Hushkits	78.6%	21.4%	100.0%	0.0%
GV	CR7, CR9, E170, E190	59.8%	40.2%	53.4%	46.6%
MD83	McDonnell Douglas MD-80's, all series	80.7%	19.3%	82.9%	17.1%

Table 4.3, Continued
DAY-NIGHT PERCENTAGES BY AIRCRAFT TYPE

INM Type	Typical Aircraft	ARRIVALS		DEPARTURES	
Scheduled Air Carrier and Commuter		Day %	Ngt %	Day %	Ngt %
<i>Commuter (Less than 50 seats)</i>					
DHC6	Large Twin Turboprops	100.0%	0.0%	100.0%	0.0%
EMB120	Embraer 120's	100.0%	0.0%	100.0%	0.0%
EMB145	CRJ-200, E135, E145	46.2%	53.8%	100.0%	0.0%
Helicopters					
AS350	Helicopters (Strip + Canyon)	100.0%	0.0%	100.0%	0.0%
General Aviation & Military					
BEC58P	Twin Piston Prop (Beech Baron)	90.9%	9.1%	87.1%	12.9%
CNA441	Twin Turboprop (King Air)	93.6%	6.4%	91.2%	8.8%
LEAR25	Med./Sm. Stage 2 Bizjet (LR24, LR25)	92.2%	7.8%	92.0%	8.0%
F-18	Military Jets (F18, F16)	100.0%	0.0%	100.0%	0.0%
GASEPV	Single Engine Prop (C172)	98.5%	1.5%	96.2%	3.8%
GIIB	Large Stage 2 Bizjet (GII, GIII, Sabr)	86.6%	13.4%	87.3%	12.7%
GIV	Large Stage 3 Bizjet (GV)	91.9%	8.1%	86.8%	13.2%
LEAR35	Med./Sm. Stage 3 Bizjet (LR35)	92.0%	8.0%	93.1%	6.9%

Sources: Clark County Department of Aviation, September 2005. Landrum & Brown Analysis, 2005.

4.2.1.5 Flight Paths

The routes along which aircraft fly to approach or depart the airport are the fourth critical component in the definition of aircraft noise patterns in the community. For this evaluation, flight paths for the No Action and Proposed Action Alternatives were developed from an analysis of the 15-day radar data sample acquired for this study. A well selected (busy day's) sample of this size is generally adequate to develop an understanding of the typical flight routes around an airport. Additionally, the 15 days can be spread throughout various seasons to account for the long-term variances associated with wind and weather patterns. For this analysis, the radar sample consisted of the following days: 5/14/04, 5/21/04, 8/11/04, 8/19/04, 10/1/04, 10/15/04, 10/22/04, 10/29/04, 1/2/05, 1/21/05, 3/17/05, 3/18/05, 4/15/05, 4/22/05, and 4/29/05.

The distribution of traffic among the modeled flight tracks developed from the radar data analysis was based on the distribution of flights in the radar data for the current Baseline and future No Action conditions. The modeled flight tracks for the Proposed Action were similarly developed through the definition of the route for the proposed STAAV 3 departure procedure and were dispersed to reflect corridor widths comparable to those associated with the current procedure.

The procedure evaluated by this SEA is an RNAV procedure and is expected to be used by approximately 95 percent of the active jet fleet operating at LAS. **Exhibit 4.1** depicts the existing and proposed arrival flight tracks used for the INM modeling of the No Action and Proposed Action scenarios. Note that this project does not change any of the arrival tracks; therefore all arrival tracks remain the same for the No Action and Proposed Action scenarios. Thus, only one color of arrival tracks is shown on the exhibit. Again, this project does not include any modifications to the arrival routes. Similarly, **Exhibit 4.2** depicts the departure flight tracks used for the INM modeling of the No Action and Proposed Action scenarios. In this case, **Exhibit 4.2** illustrates two colors of departure tracks; the green tracks represent the No Action departure tracks while the gold tracks represent the Proposed Action tracks. Note that many of the departure routes remain the same for both scenarios, thus only one color is evident for many routes.

4.2.1.6 Flight Profiles

An optional element of the INM provides the ability to define descent profiles representative of the proposed procedures and is a fifth critical component of the input. For high altitude noise assessments, arrival and departure procedures are evaluated to an altitude of 10,000 feet above the airport field elevation (AFE). For the purposes of INM modeling, AFE is used to assess the relationship between aircraft altitude and the airport field elevation. The INM also takes into account terrain data to calculate the altitude of the aircraft above the ground. For the purpose of presenting altitudes in this SEA, the Proposed Action and No Action Alternatives reflect AGL elevations for all exhibits and tables.

In each case, the evaluation is tempered by the requirement that the cumulative annual average noise level under these flight paths must exceed 45 decibels of DNL and that the increase from baseline conditions must exceed 5 dB if between 45 and 60 DNL; 3 dB if between 60 and 65 DNL; and 1.5 dB if the noise level of the proposed condition is greater than 65 DNL. The default approach profile associated with the INM calls for a three degree descent from 6,000 feet AFE. Beyond that point, the model assumes a continuation of the descent below 6,000 feet AFE. For this analysis, the approach profiles for each modeled aircraft were extended along the INM's standard 3° approach profile to 10,000 feet AFE.

Similarly, revisions to departure procedures are to be evaluated to an altitude of 10,000 feet AFE, tempered by the provision that they are notable if they result in an increase in DNL as described in the previous paragraph. The default profiles for the various aircraft expected to use LAS result in attainment of 10,000 feet AFE at distances from the airport ranging from 13 to 30 miles along the route of flight. The aircraft that are associated with the slowest climbs are those that are the largest and heaviest (B-747, DC-10, etc) bound for destinations more than 1,500 miles from the airport. Small aircraft bound to the same locations typically reach 10,000 feet AFE between 15 and 25 miles along the route of flight. Consequently, the aircraft departing LAS will, on an average day, normally be above 10,000 feet AFE before they reach the first transition fix leading out of the TRACON boundary.

4.2.1.7 Route Utilization

The frequency at which a flight route is used is the sixth critical component necessary to predict the noise pattern in the region. An assessment of the radar data sample provided the general traffic distribution pattern among departure and approach routes leading from/to LAS. See **Appendix B** for existing and proposed route utilization information.

4.2.1.8 Runway Usage

The seventh and final factor used to program the INM was the assumed utilization of the runways. The distribution of traffic among the runways at LAS was provided by the CCDOA and was based on a detailed study of 2004 operations at LAS. The runway-use proportions provided by the CCDOA were assumed to be representative of the annualized condition for both the No Action and Proposed Action conditions in the existing and future time frames. Use of individual runways, as drawn from analysis, is presented in **Table 4.4**. Runway usage would not be changed due to the Proposed Action. Therefore, the runway use percentages shown on **Table 4.4** are representative of both the Proposed Action and the No Action. The specific use of individual runways at the various satellite facilities is not critical to the assessment of the impacts of the Proposed Action evaluated in this document.

Table 4.4
RUNWAY USAGE

Aircraft Group	Runway	Departures		Arrivals	
		Day	Night	Day	Night
Jets	19L	23.6%	7.8%	8.1%	15.6%
	19R	1.3%	0.8%	4.3%	3.0%
	1L	1.6%	1.1%	6.8%	4.0%
	1R	10.5%	7.3%	5.6%	3.1%
	25L	0.4%	1.0%	72.0%	67.3%
	25R	53.9%	80.6%	1.1%	6.5%
	7L	8.6%	1.4%	0.0%	0.1%
	7R	0.1%	0.0%	1.9%	0.4%
	Total	100.00%	100.00%	100.00%	100.00%
General Aviation/ Other	19L	34.0%	18.8%	5.8%	8.0%
	19R	30.4%	41.8%	61.0%	53.4%
	1L	9.6%	5.7%	13.8%	9.2%
	1R	5.9%	3.4%	1.8%	2.4%
	25L	1.8%	4.5%	15.5%	12.5%
	25R	9.8%	21.7%	0.6%	12.8%
	7L	7.8%	3.9%	0.4%	1.3%
	7R	0.6%	0.2%	1.0%	0.4%
	Total	100.00%	100.00%	100.00%	100.00%

Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.

Source: Clark County Department of Aviation, September 2005. Landrum & Brown Analysis, 2005.

4.2.2 Assessing the Impact of Noise

The FAA has considered the matter of threshold levels above which aircraft noise causes an adverse impact on people and has established 65 DNL as the threshold above which aircraft noise is considered incompatible with residential areas. In addition, the FAA has determined that a significant impact occurs if a proposed action would result in an increase of 1.5 DNL or more on any noise-sensitive area within the 65 DNL exposure level.^{7,8,9}

In 1992, the Federal Interagency Committee on Noise (FICON) recommended that noise increases of 3 dB or more between DNL 60 and 65 dB be evaluated in environmental studies when increases of 1.5 DNL or more occur at noise-sensitive locations at or above 65 DNL. Increases of this magnitude below 65 DNL are not to be considered as *significant impacts*, but they are to receive consideration. The FAA adopted FICON's recommendation into FAA Order 1050.1E.

In 1990, the FAA issued a noise screening procedure for determining whether certain airspace actions above 3,000 feet above ground level (AGL) might increase DNL levels by five decibels or more.¹⁰ The procedure served as a response to FAA experience that increases in noise of 5 dB or more at cumulative levels well below 65 DNL could be disturbing to people and become a source of public concern. In past air traffic environmental evaluations, the FAA has evaluated noise levels down to the 45 DNL level for potential increases in DNL noise exposure of 5 dB or more. The FAA formalized the use of this threshold of change in the recent release of FAA Order 1050.1E. The criteria for assessing increased noise exposure are described below:

- 1.5 dB or more increase within the area exposed to an average annual dB of 65 decibels or more by the proposed project (an environmentally significant increase).¹¹ NEPA guidance states that an increase of 1.5 dB within an area of 65 DNL is considered a significant impact and therefore this analysis is required to determine if significant noise impacts result from the Proposed Action.
- 3.0 dB or more increase within the area exposed to an average annual dB of between 60 and 65 decibels by the proposed project (a reportable increase). This marginal impact area is based on guidance provided by the Federal Interagency Committee on Noise (FICON), which is used to identify noise impacts outside 65 DNL.

⁷ FAA Order 1050.1E, Appendix A, Section 14, Noise.

⁸ FAR Part 150 Section 150.21(a)(2)(d).

⁹ FICON 1992, Pp. 3-5.

¹⁰ FAA Notice 7210.360. September 14, 1990.

¹¹ For environmental evaluations, these areas of reportable difference were developed by applying the Noise Level Difference computation option of the INM. This option subtracts the noise levels computed for the No Action condition from the Proposed Action condition to indicate the change associated with the proposed modification to the baseline condition. This analysis is based on FAA Notice FAA-AEE-99-01.

- 5.0 dB or more increase within the area exposed to an average annual dB of between 45 and 60 decibels by the proposed project (a reportable increase).⁹

Noise exposure contours and areas of increased noise exposure were prepared in accordance with the above criterion in order to determine if potential noise impacts would occur as a result of the Proposed Action.

4.2.2.1 Baseline 2004 Noise Impacts

The baseline 2004 noise conditions were modeled to provide a current point of reference for considering the future noise impacts with and without the project. **Exhibit 4.3** displays the noise exposure contours for the 2004 conditions. As shown in **Exhibit 4.3**, the current noise pattern around LAS is generally aligned with the runway geometry of the airport. The 60 DNL noise contour extends some five miles to the west of the airport and exhibits a bend to the south due to the predominant use of the left (southerly) turn procedures from Runways 25L and 25R. The noise pattern north of the airport extends approximately 2.5 miles north of the airfield and exhibits a rounded shape along the extended runway centerlines of Runways 1L and 1R. To the south, the noise pattern generally follows the extended runway centerlines for Runways 19L and 19R and extends some four to five miles south of the airport. The noise pattern east of LAS is dominated by arrival traffic and extends about five miles east of the airport. Table 4.5 presents the number of people within the Study Area and acres within the noise contours for the 2004 Baseline conditions.

Table 4.5
NOISE IMPACTS FOR BASELINE 2004

Condition	60 - 65 DNL	65 – 70 DNL	70 - 75 DNL	75+ DNL
Population				
2004 Baseline	37,967	10,121	3,640	2,298
Area (Acreage)				
2004 Baseline	9,603	3,787	1,405	1,501

Sources: U.S. Census Bureau, 2000 Census. Landrum & Brown Analysis, 2005.

4.2.2.2 Future 2005 and 2010 Noise Impacts

Exhibit 4.4 displays the noise exposure contours for the 2005 No Action and 2005 Proposed Action conditions. Areas of increased noise exposure are highlighted on the exhibit as well. **Exhibit 4.5** provides a detailed view of the 3.0 dB increase within the 60 DNL area as well as the 5.0 dB increases within the 45 DNL areas. Similarly, **Exhibits 4.6 and 4.7** display the noise exposure contours for the 2010 No Action and 2010 Proposed Actions conditions, as well as the areas of increased

noise exposure. **Table 4.6** summarizes the number of people and acres within the increased noise areas for 2005 and 2010 (Proposed Action) conditions.

Table 4.6
AREAS OF INCREASE FOR PROPOSED ACTION

Condition	1.5 dB Increase within 65 DNL	3.0 dB Increase within 60-65 DNL	5.0 dB Increase within 45-60 DNL
Population			
2005 Proposed Action	0	177	73,468
2010 Proposed Action	0	196	73,035
Area (Acreage)			
2005 Proposed Action	0	182	12,650
2010 Proposed Action	0	202	12,690

Source: Landrum & Brown, 2005

Refer to **Section 4.2.1** for a discussion of significant and marginal impacts.

1.5 dB Increases

There were no areas of +1.5 dB change within the 65 DNL noise exposure resulting from the proposed project for 2005 or 2010 conditions.

3.0 dB Increases

One area along the extended centerlines and west of Runways 7/25 would be exposed to noise increases of 3.0 dB or more within the 60 DNL contour for both the 2005 and 2010, Proposed Action condition. This area would experience an increase in noise exposure under the Proposed Action conditions because the departure routes from Runways 25R/L (going to eastern destinations) would now turn right and proceed around the airport to the north rather than to the south as they currently do. In both the 2005 and 2010 Proposed Action condition, the 3.0 dB increases within the 60 DNL would occur over mostly residential areas west of the airport.

FAA policy based on the FICON findings indicates that a 3.0 dB increase in noise within the 60 DNL areas should be considered for mitigation when a 1.5 dB noise increase is found within the 65 DNL noise level areas. Since this trigger was not found for this project, the 3.0 dB increase area is provided for informational purposes only. Consequently, no mitigation measures would be required for the Proposed Action, because this impact is not considered a significant impact.

5.0 dB Increases

There are two areas of 5 dB increases between the 45 and 60 DNL contours found around the airport resulting from the new procedure. The locations to the west/northwest result from the same relocated flight routes as described above for the 3.0 dB increase area. Again, these areas of change are only considered to be *slight to moderate* in nature and do not represent a significant impact. The areas are disclosed here for informational purposes only.

4.2.2.3 Additional Noise Impacts

For the No Action scenario, a close-in view of the existing STAAV 2 departure procedure is shown in **Exhibit 4.8** and the existing departure flight paths modeled for departures on Runways 25L and 25R are shown in **Exhibit 4.9**. For the Proposed Action scenario, a close-in view of the proposed STAAV 3 departure procedure is shown in **Exhibit 4.10** and the proposed departure flight paths modeled for departures on Runways 25L and 25R are shown in **Exhibit 4.11**.

As shown in **Exhibits 4.9 and 4.11**, specific grid point locations under the existing (No Action) and proposed departure paths (Proposed Action) are identified with a code and values for DNL, number of operations, and the typical average altitude of aircraft on the route above that location. The altitude range represents the range of altitudes Above Ground Level that most departures near the grid point will fall within. The DNL values and Daily Operations values present the expected noise levels and daily number of flights over each site for the 2005 condition. This information is summarized in **Table 4.7**. A comparison of the No Action and Proposed Action DNL values at the various locations under the flight tracks indicate that in some cases, the noise levels increase north of the airport under the new procedure while decreases are evident south of the airport. Further information regarding this grid analysis is presented in **Appendix B**.

4.2.3 No Action

Implementation of the No Action would result in no changes in existing conditions. No adverse impacts would result and no mitigation measures would be required.

4.2.4 Proposed Action

For this SEA, the Proposed Action condition was assessed for both 2005 and 2010 conditions. The findings indicate that although aircraft noise levels would increase at some locations, there are no significant noise increases (1.5 dB within the 65 DNL over non-compatible land use). Therefore no mitigation actions would be required.

Table 4.7
NOISE LEVELS AT SPECIFIC LOCATIONS UNDER FLIGHT PATHS

Location*	DNL Levels		Daily Operations		Typical Aircraft Altitude Range(AGL)	
	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
D1	52.9	59.3	2	127	3,005 - 3,005	2,005 - 4,005
D2	46.8	51.0	2	127	5,200 - 6,200	5,200 - 6,200
D3	37.1	42.6	1	127	6,665 - 7,165	7,165 - 13,165
D4	27.9	30.0	14	127	12,350 - 13,350	9,350 - 17,350
D5	57.8	55.5	332	220	3,550 - 5,550	3,550 - 5,550
D6	48.8	45.9	214	101	6,810 - 8,310	6,810 - 8,810
D7	39.3	38.7	112	101	10,860 - 12,360	10,360 - 12,360
D8	23.1	23.0	14	127	8,624 - 18,124	8,124 - 19,124
D9	28.4	28.4	28	127	16,197 - 20,697	16,697 - 26,697
M6	60.1	59.7	332	220	2,360 - 3,360	2,860 - 3,860
M7	61.8	60.3	332	220	2,370 - 3,370	2,870 - 3,870
S1	43.3	43.7	1	127	6,700 - 7,200	7,200 - 13,200
S2	50.5	49.0	15	127	5,700 - 8,700	7,200 - 13,200
S3	57.1	56.7	15	127	4,492 - 7,492	5,992 - 11,992
S4	46.7	53.4	14	127	3,425 - 4,225	3,425 - 6,425
S5	49.6	52.6	14	127	4,075 - 5,575	5,575 - 8,575
S6	46.2	50.9	14	127	3,970 - 5,470	4,470 - 7,470
S7	51.6	51.9	14	127	5,340 - 6,840	5,840 - 9,840
S8	33.4	35.9	1	127	7,000 - 7,200	6,000 - 14,000

Note: AGL refers to Above Ground Level

* See **Appendix B** for details regarding grid point designator codes

Source: Landrum & Brown, 2005.

4.3 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

FAA Order 1050.1E, Appendix A, Section 6, *Department of Transportation Act, Section 4(f)*, states that Section 4(f) of the *Department of Transportation Act of 1966* (DOT Act) provides that "...the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from an historic site of national, state, or local significance as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land and such program, and the project includes all possible planning to minimize harm resulting from the use."

Section 4(f) of the DOT Act protects parks, recreation areas, wildlife and waterfowl areas and historic structures eligible for or listed on the National Register of Historic Places (NRHP), which are commonly referred to as Section 4(f) lands or properties. Although Section 4(f) of the DOT Act has been recodified and renumbered as 303(c) of 49 USC Section, this order continues to refer to Section 4(f) because it would create needless confusion to do otherwise; the policies Section 4(f) engendered are widely referred to as Section 4(f) matters.¹²

The key word in the DOT Act is *use* of Section 4(f) land, which is interpreted to include outright physical taking, as well as other kinds of constructive use that may adversely impact the land. The DOT Act is further interpreted that a proposed project is compatible if it would not affect the normal activity or aesthetic value of a 4(f) property. Aircraft noise levels that would substantially interfere with the use and value of Section 4(f) lands or that restrict the activities normally occurring at those properties would constitute a constructive use of the property. Under Section 4(f) of the DOT Act, Native American lands are also protected from potential impacts of a proposed project.

A discussion of potential noise impacts of the Proposed Action is included in **Section 4.2, Noise**. Potential aesthetic impacts of the Proposed Action are discussed in **Section 4.5, Visual Impacts**. Please refer to **Section 4.4, Historic Architectural, Archeological, and Cultural Resources**, for additional discussion regarding the potential impact to the ten-acre reservation of the Las Vegas Paiute Tribe, which is located within the City limits of Las Vegas, Nevada and is the only Native American Community located in the Study Area for the Proposed Action. **Exhibit 3.6** shows the location of all public lands that are located within the Study Area for the Proposed Action.

4.3.1 No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

4.3.2 Proposed Action

The procedures that would result from implementation of the Proposed Action would overfly Muddy Mountains Wilderness Area, Lake Mead National Recreation Area, and a Native American Community (the Las Vegas Paiute Tribe's ten-acre reservation). Aircraft overflights of the Muddy Mountains Wilderness Area are anticipated to be at or above 10,000 feet AGL with a DNL of 23.0 for 2005 and 23.8 for 2010. Aircraft overflights of the Lake Mead National Recreation Area are anticipated to be at or above 16,000 feet AGL with a DNL of 28.4 for 2005 and 29.1 for 2010 (see **Section 4.2, Noise**, of this chapter for more detailed information). However, the Proposed Action would not increase the area exposed from the

¹² FAA Order 1050.1E, Appendix A, Section 6, *Department of Transportation Act, Section 4(f)*. June 8, 2004.

existing conditions or add additional areas. Further, the Proposed Action does not take or use Section 4f lands, therefore, no adverse impacts would result, and no mitigation measures are required.

4.4 HISTORIC, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

FAA Order 1050.1E, Appendix A, Section 11, *Historic, Architectural, Archeological, and Cultural Resources*, states that the Criteria of Effect and Adverse Effect, as defined in the *National Historic Preservation Act (NHPA)* (36 CFR 800.9) are used to evaluate an undertaking's effect on a historic property by specifying that "...an undertaking has an effect on a historic property when the undertaking may alter the characteristics of the property that may qualify the property for inclusion in the National Register..." and "...when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association."

Potential impacts on cultural resources include direct and indirect impacts. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts occur later in time and/or further removed in distance, but they are still reasonably foreseeable. The physical displacement, demolition, or alteration of a resource is a direct impact. Changes in the use, operation, or character of the resource may either be a direct or indirect impact. The regulations require the lead agency, in consultation with the State Historic Preservation Officer (SHPO), to determine whether that effect is adverse.

Adverse effects include, but are not limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from, or alteration of the character of, the property's setting when that character contributes to the property's qualification for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of the property.

The NHPA further states that "...the responsible federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark, and shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking." Finally, the *Department of Transportation Act of 1966* stipulates that any undertaking that requires the use of a historic structure shall not be approved without prior demonstration that (1) "there is no prudent and feasible alternative, and (2) the project includes all possible planning to minimize harm to the historic property resulting from such use." If an undertaking is determined to

have an adverse effect on properties included in, or eligible for, the National Register of Historic Places, the lead federal agency and the State Historic Preservation Office (SHPO) enter into consultation to identify ways to avoid or reduce the adverse effects. The Advisory Council on Historic Preservation (ACHP) and other interested parties also can participate in the consultation process.

The Nevada State Historic Preservation Office (SHPO) was notified of the Proposed Action by the FAA, Western Terminal Operations, in a Project Coordination letter, dated August 11, 2005 (see **Appendix D**). In its first response to the FAA, dated September 12, 2005, the Nevada SHPO stated its "...concurrence with the FAA's determination that the efforts outlined in their Aug. 11, 2005 (agency coordination) letter are adequate to identify historic properties."¹³ In its second response to FAA, dated November 3, 2005, the Nevada SHPO stated its "...concurrence with the FAA's determination that the proposed undertaking has no potential to cause effects on historic properties in Nevada."¹⁴ Please refer to **Appendix D, Agency Coordination and Public Involvement**.

As previously stated in **Section 3.4.5.1, Las Vegas Paiute Reservation/Las Vegas Indian Colony** and **Section 4.3, Department of Transportation Act, Section 4(f)**, the Study Area for the Proposed Action includes ten-acres of the Las Vegas Paiute Tribe Reservation. Section 106 of the NHPA allows for the appointment or designation of a Tribal Historic Preservation Officer (THPO) to serve as the official representative of a Native American Tribe for the purpose of coordination with the Tribe regarding a proposed undertaking. Prior to implementation of the Four Corner-Post Plan in October 2001, the 10-acre portion of the Las Vegas Paiute Reservation that is located within the Study Area for the Proposed Action received traffic from the OVETO SID. After the implementation of the Four Corner-Post Plan, the Reservation continued to receive eastbound vectored traffic, which mimicked the OVETO SID route. Therefore, the Proposed Action would not establish new air traffic routes over Native American Communities, no effects on the Las Vegas Paiute Reservation are anticipated as a result of the Proposed Action, and no coordination with a THPO is required.

The location of the 10-acre portion of the Las Vegas Paiute Reservation that is within the Study Area for the Proposed Action is shown in **Exhibit 3.6, Public Lands**, and **Figure 3.2**.

4.4.1 No Action

Implementation of the No Action Alternative would result in no changes from existing conditions. No adverse impacts would result and no mitigation measures are required.

¹³ Correspondence from Rebecca Palmer, Nevada State Historic Preservation Office, to John Clancy, FAA Western Terminal Operations, dated September 12, 2005. See **Appendix D**.

¹⁴ Correspondence from Rebecca Palmer, Nevada State Historic Preservation Office, to John Clancy, FAA Western Terminal Operations, dated November 3, 2005. See **Appendix D**.

4.4.2 Proposed Action

As previously described in **Section 3.6, Historic, Architectural, Archaeological, and Cultural Resources**, and shown on **Exhibit 3.10, Historic Properties**, twenty-two sites listed on the National and State of Nevada Registers of Historic Places and one Native American Reservation are located within the Study Area for the Proposed Action. However, because the Proposed Action would utilize existing flight paths over these sites and would not result in a *take or use* of any of these sites, no adverse impacts would result and no mitigation measures are required.

4.5 VISUAL IMPACTS

FAA Order 1050.1E, Appendix A, Section 12, *Light Emissions and Visual Impacts*, states that “Visual, or aesthetic, impacts are inherently difficult to define because of the subjectivity involved. Aesthetic impacts deal more broadly with the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable. The visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact.” Normally, visual impacts are a result of construction, development, or even demolition projects. Air traffic routes seldom cause visual impacts except on clear nights where blinking beacons on an aircraft or landing lights become visible. Contrails are often visual impacts occurring during daylight hours when an aircraft at a high altitude produces a condensation trail (contrail) as a result of water or ice particles forming when the hot air of the jet’s exhaust mixes with the cold air of the upper atmosphere. This occurs mostly in the upper troposphere and the upper stratosphere at altitudes exceeding 26,400 feet or five miles above the earth.

4.5.1 Visual Impacts to Public Lands

Limited research exists that deals with the impacts of aircraft overflights on visitors to public lands, such as national parks and recreation areas. In 1987, Public law 100-91 directed the National Park Service (NPS) and the U.S. Forest Service to conduct studies of aircraft overflights that might be affecting visitors of national parks and wilderness areas. The resulting *Report on Effects of Aircraft Overflights on the National Park System* and the *Potential Impacts of Aircraft Overflights of National Forest System Wilderness* are among the only large-scale studies in which a concerted effort has been made to apply quantitative methods to the problems of measuring the reactions of outdoor enthusiasts to aircraft noise exposure in wilderness type environments, including national parks. Results of these studies suggest that visitors to a public land, such as a national park, recreation area, wilderness area, or wildlife refuge, have different expectations and tolerances for intrusions during their visits. In the sense that a wilderness experience should not have any reminder of civilization or society, however slight or brief, aircraft presence, even at a high altitude, would affect this outdoor experience. This same principle stands with Native American visual impacts. In certain situations, the

visual presence of aircraft could interfere with tribal ideals and rituals, which involve solitude and natural quiet in primitive areas.^{15, 16}

4.5.2 No Action

Implementation of the No Action Alternative would result in no changes from existing conditions. No adverse impacts would result and no mitigation measures are required.

4.5.3 Proposed Action

Under the Proposed Action, visual impacts that could potentially occur include the visual sight of aircraft, aircraft contrails, or aircraft lights at night. Because implementation of the Proposed Action would mimic the OVETO SID, which was in place prior to implementation of the Four Corner-Post Plan in October 2001, and would continue the use of departure procedures similar to the current eastbound vectored aircraft, these aircraft have not and would not linger in the area or create a permanent impairment. Therefore, the Proposed Action would not constitute an adverse impact, as stated in FAA Order 1050.1E, Appendix A, Section 12, *Light Emissions and Visual Impacts*, and no mitigation measures are required.

Table 4.8
SUMMARY MATRIX OF POTENTIAL IMPACTS FOR EACH ENVIRONMENTAL RESOURCE IMPACT CATEGORY, BY ALTERNATIVE

Resource Impact Category	No Action Alternative	Proposed Action Alternative
Air Quality	Current STAAV procedure was exempt from the general conformity regulations. No Potential Impact.	Exempt from the general conformity regulations. No Potential Impact.
Coastal Resources	No coastal zone management areas or coastal barriers are associated with the current STAAV procedure. No Potential Impact.	No coastal zone management areas or coastal barriers have been identified within the Study Area for the Proposed Action. No Potential Impact.
Compatible Land Use	The current STAAV procedure does not exceed the thresholds for a significant impact on noise-sensitive land use. No Potential Impact.	Does not exceed the thresholds for a significant impact on noise-sensitive land use. There will be No adverse impact on noise-sensitive land uses. No Potential Impact.

¹⁵ National Park Service *Report on Effects of Aircraft Overflights on the National Park System*. U.S. Department of the Interior, National Park Service, July 1995.

¹⁶ U.S. Forest Service, July 1992.

Table 4.8, Continued

SUMMARY MATRIX OF POTENTIAL IMPACTS FOR EACH ENVIRONMENTAL RESOURCE IMPACT CATEGORY, BY ALTERNATIVE

Resource Impact Category	No Action Alternative	Proposed Action Alternative
Construction Impacts	No construction impacts resulted from the implementation of the current STAAV procedure. No Potential Impact.	No potential construction impacts.
Department of Transportation Section (4f)	The existing STAAV procedure did not increase the area exposed from the previous procedure nor add, take or use additional areas. No adverse impacts resulted. No Potential Impact.	Will not <i>increase the area</i> exposed from the existing conditions or <i>add additional</i> areas. Further, the Proposed Action does not <i>take or use</i> publicly owned land, therefore, no adverse impacts would result.
Farmlands	The existing STAAV procedure has No affect on farmlands.	No potential effect on farmlands.
Fish, Wildlife and Plants	The current STAAV procedure had No impact to federal or state-listed threatened or endangered species and/or their respective critical habitats. No Potential Impacts.	No potential impact to federal or state-listed threatened or endangered species and/or their respective critical habitats.
Floodplains	No floodplains were affected as a result of implementing the existing STAAV procedure. No Potential Impacts.	No floodplains would be affected. No Potential Impacts.
Hazardous Materials, Pollution and Solid Waste	No Potential Impacts occurred as a result of implementing the STAAV procedure. No Potential Impact.	No Potential Impacts.
Historical, Architectural, Archeological and Cultural Resources	The existing STAAV procedure had no effect on archaeological or historic properties. No Potential Impacts.	No Potential Impacts to archaeological or historic properties.
Light Emissions and Visual Impacts	There have been No light emissions or visual impacts documented as a result of the STAAV procedure. No Potential Impact.	No Potential Impact.
Natural Resources and Energy Supply	No increase in energy supply or construction materials occurred as a result of the STAAV procedure. No Potential Impact.	No increase in energy supply or construction materials would be required. No Potential Impact.

Table 4.8, Continued

SUMMARY MATRIX OF POTENTIAL IMPACTS FOR EACH ENVIRONMENTAL RESOURCE IMPACT CATEGORY, BY ALTERNATIVE

Resource Impact Category	No Action Alternative	Proposed Action Alternative
Noise	Implementation of the No Action alternative would result in no change to existing conditions.	As a result of a reduction in the left hand turnouts, noise along those southern flight paths will be reduced. Noise along the modified STAAV procedure will increase slightly but not in excess of standard thresholds. No Adverse Impact.
Secondary (Inducted) Impacts	The existing STAAV procedure did not cause shifts in patterns of population movement and growth, public service demands, or change in business and economic activity. No Potential Impact.	Would not cause shifts in patterns of population movement and growth, public service demands, or change in business and economic activity. No Potential Impact.
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety	No socioeconomic impacts exist as a result of the STAAV procedure. No Potential Impact.	No potential socioeconomic impacts would occur.
Water Quality	No surface or ground water resources including aquifers, wetlands, streams, rivers, or floodplains are affected by the current STAAV procedure. No Potential Impact.	No surface or ground water resources including aquifers, wetlands, streams, rivers, or floodplains would be affected. No Potential Impact.
Wetlands	Current STAAV procedure does not impact wetlands. No Potential Impact.	Would not impact wetlands. No Potential Impact.
Wild and Scenic Rivers	Current STAAV procedure does not impact any Wild and Scenic Rivers. No Potential Impact.	No designated Wild and Scenic Rivers or rivers with the potential for designation have been identified. No Potential Impact.

4.6 CUMULATIVE IMPACTS

The regulations of the Council on Environmental Quality (40 CFR Section 1508.7 et seq.) require the study of incremental impacts of a Proposed Action when added to other past, present, and reasonable foreseeable future actions, regardless of the agency (federal or non-federal) that undertakes such action.

4.6.1 Past Actions

The following section describes past airspace actions at LAS and other surrounding airports that have been completed and may have standing or influence upon this projects Proposed Action.

4.6.1.1 The Four Corner-Post Plan

As previously stated in **Sections 1.4.1 through 1.4.3** of this document, the Four Corner-Post Plan was developed and implemented at LAS to improve airspace efficiency by alleviating the potential for airspace conflicts within Las Vegas TRACON airspace. Prior to the development of the Four Corner-Post Plan at LAS, all of the Airport's STARs and SIDs were conventional procedures, which utilize earth-based navigational aids. The inefficiencies in the Las Vegas TRACON's airspace prior to implementation of the Four Corner-Post Plan existed because the approach and departure procedures at LAS used the same flight-path corridors to the northeast, west, southeast, and southwest, which increased the potential for airspace conflicts. Several factors contributed to the design and evolution of these procedures; among them include:

- The limitation of conventional earth-based navigational aids
- The predominant runway configurations in place at LAS prior to implementation of the Four Corner-Post Plan
- Informal noise abatement procedures at McCarran International Airport
- The adjacent Nellis Air Force Base (LSV)

Nellis Air Force Base is located approximately eight nautical miles (NM) north of LAS. The Nellis Air Traffic Control Facility (NATCF) provides air traffic control (ATC) services for aircraft operating to and from Nellis and, at times, North Las Vegas Airport. The airspace delegated to NATCF is immediately adjacent to Las Vegas TRACON and both share a common airspace boundary. There is a portion of airspace delegated to NATCF identified as Area A. This portion of airspace is vertically divided with NATCF responsible for the airspace from the surface to 6,000 feet MSL and Las Vegas TRACON responsible for 7,000 feet MSL through 9,000 feet MSL. In order to ensure proper separation of aircraft controlled by NATCF, and those controlled by Las Vegas TRACON, each control facility is required to ensure aircraft under their control remains at least 1.5 NM from the common airspace boundary. When this cannot be accomplished, controllers at each facility must directly communicate to ensure coordination, adding to controller workload.

The purpose of the Four Corner-Post Plan was to enhance airspace and air traffic control efficiency by eliminating airspace conflicts and reduce controller workload. It was intended to increase safety and efficiency and lead to a reduction in aircraft delay by realigning the STAR and SID procedures; taking full advantage of technology developments. The procedures in use prior to the Four Corner-Post Plan created airspace conflicts because they required arrivals and departures to use the same flight path corridors. The result was that departing aircraft were unable to climb unrestricted to cruising altitude and arriving aircraft were unable to descend in a timely manner, which required rigorous attention by the air traffic controllers to monitor altitudes, ensure safe separation was maintained and ensure aircraft remained within delegated airspace. It also imposed operational penalties on aircraft operators. Aircraft unable to climb used more fuel at the lower altitudes and caused a greater noise impact on the community. Additionally, descending aircraft were precluded from applying power-off, fuel-efficient descent techniques.

4.6.1.2 Implementation of the Four Corner-Post Plan

As previously described in **Sections 1.4.5 and 1.4.6** of this document, implementation of the Four Corner-Post Plan at LAS in October 2001 accomplished the purpose and need of the project, which allowed air traffic to be managed more efficiently, resulting in benefits for the users and managers of the National Airspace System (NAS). However, after implementation, several deficiencies were experienced. The original RNAV SIDs employed fly-by waypoints designed to emulate the three nautical mile fix. After implementation, however, it was found that aircraft were turning too far west of the intended route, which did not produce the intended operational benefits. Additionally, it created a wider dispersion impact and ground tracks varied significantly. Consequently, the FAA suspended the RNAV departure procedures for a 30-day period starting October 4, 2002, and vectored all departures.

Three interim changes were made to the Four Corner-Post Plan in January 2003, November 2003, and March 2005 (see **Sections 1.4.6.1 through 1.4.6.2**) in an effort to reconcile the initial turning point for aircraft departing LAS, address both the concerns of the communities surrounding LAS and of the Clark County Department of Aviation (CCDOA), and to more accurately contain the departure tracks within the Cooperative Management Area (CMA) and ensure aircraft would exit the CMA through the egress gate required by CCDOA.

4.6.2 Present Actions

This section describes development and improvement plans at LAS and at other airports located within the vicinity of LAS that are currently being proposed or were recently completed.

4.6.2.1 Modification to the STAAV RNAV SID (The Proposed Action)

As previously discussed in **Section 1.5, Purpose and Need**, of this document, implementation of the proposed STAAV 3 RNAV SID would further improve efficiency in the LAS airspace, ensure LAS can meet its forecast future demand, reduce its potential for future delays, provide operational benefits to the airlines and other users of LAS, and reduce the aircraft noise exposure patterns for communities south and southwest of the Airport, while maintaining a commensurate level of safety. The STAAV 3 RNAV SID would also meet the following needs:

- The implementation of the Four Corner-Post Plan in October 2001 never cancelled the OVETO (conventional) SID. Instead, a NOTAM was issued, stating that the procedure was “not available.”
- The need to recapture the effectiveness that was lost from the reduction in the use of the right-turn procedure from Runway 25 for eastbound traffic as part of the implementation of the Four Corner-Post Plan at LAS. The proposed solution to the problem is the modification of the STAAV RNAV SID (to be designated STAAV 3) for Runway 25 departures to enhance eastbound traffic at LAS.
- The need to accommodate LAS’s sustainable annual capacity of 625,000 annual aircraft operations (based upon an average delay exceeding 6 minutes per aircraft operation, assuming that 78 percent of aircraft operations are conducted by scheduled air carriers and commuter operators). The 2001 Four Corner-Post Plan Final Environmental Assessment presented annual operations of 622,000 by the year 2005 at LAS.
- The need to implement operational changes at LAS as a direct result of increases in total passengers and operation levels.
- The need to accommodate an increase in annual operations at a rate of approximately 2.41 percent per year; due to the fact that aviation activity at LAS has recovered from the events of September 11, 2001 faster than at other US airports.
- Airlines in operation at LAS that serve destinations east of Las Vegas are now seeking an RNAV right-turn SID from Runway 25 for eastbound traffic because they believe the longer left-turn leg length now required with the Four Corner-Post Plan has imposed an unfair cost burden on them. This concern has escalated as fuel prices have increased in 2004 and 2005. The air carriers serving LAS have made a substantial financial investment by modernizing their fleet and want to obtain the highest level of efficiency possible on their investment. The requirement for all Runway 25 and Runway 19 departures to fly over a single waypoint (ROPPR) southwest of the airport has required ATC to provide additional spacing for a Runway 19 departure when preceded by a Runway 25 departure. This circumstance has been exacerbated by the continual increase in traffic demand.

4.6.2.2 Airport Capital Improvement Plan at LAS

As previously discussed in **Section 3.1.2.1, Current Airport Development Projects**, and **Section 3.1.2.2, Planned Future Airport Development Projects**, LAS will experience continual maintenance and repair projects for their runways, taxiways and ramp areas, over the next several years, as well as numerous terminal repair and construction projects, if approved. These development, maintenance, or repair projects at LAS are independent of the Proposed Action but should be mentioned. These construction/maintenance/repair projects would not cause additional environmental impacts beyond those evaluated in this document.

4.6.2.3 Henderson Executive Airport

In March 2003, a new runway (17R/35L) was opened at Henderson Executive Airport (L15). Measuring 6,500 feet long by 100 feet wide, Runway 17R/35L is designed to accommodate small corporate aircraft and is classified as Airport Reference Code (ARC) Design Category B-II, which accommodates aircraft with approach speeds ranging from 91 knots to 121 knots and wing spans of 49 to 78 feet.¹⁷ Construction of parallel Runway 17L/35R, which measures 5,000 feet long by 75 feet wide, was completed in October 2003 to provide flexibility in managing the increasing level of aircraft operations at L15.¹⁸

Future plans at L15 include hangar and terminal development. Two new shade hangars with 37 aircraft parking positions were completed in February 2004. Construction was also recently completed on the necessary infrastructure to support 95 new enclosed hangars ranging in size from 1,600 to 5,800 square feet. Construction currently underway at L15 includes a general aviation/corporate terminal with approximately 22,000 square feet of space, a stand-alone Air Traffic Control Tower, and hangar/office facilities for use by commercial aviation-related businesses. Construction of these facilities began in September 2004 and is estimated to be complete in late 2006.¹⁹

¹⁷ As described in FAA Advisory Circular 150/5300-13, Change 7, *Airport Design*, Ch. 1, Paragraph 4, Airport Reference Code, October 1, 2002, the ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at an airport, which are represented by a design aircraft. The design aircraft is the most demanding aircraft type currently using, or projected to use, an airport, with a minimum of 500 operations per year, and can either be one aircraft, or a group of aircraft. The first component of the ARC is a capital letter (A, B, C, or D with A being the lowest, and D being the highest) that refers to the approach speed of the design aircraft in its landing configuration. The second component, which is depicted by a Roman numeral (I, II, III, IV, V, or VI with I being the lowest and VI being the highest) that refers to wingspan of the design aircraft. Together, the two components relate aircraft operational and physical characteristics to the required design criteria of various airport dimensions, such as runway and taxiway widths, runway to taxiway separation standards, and obstacle clearance items. Under this methodology, safety margins are provided in the physical design of airport facilities.

¹⁸ Henderson Executive Airport. On-line at <http://www.mccarran.com/>. Retrieved October 27, 2005.

¹⁹ Henderson Executive Airport. On-line at <http://www.mccarran.com/>. Retrieved October 27, 2005.

Henderson Executive Airport's recently completed and proposed projects are independent of the approval or disapproval of this Supplemental Environmental Assessment and their nature is such that they are not likely to contribute to any cumulative impacts associated with the Proposed Action being evaluated in this document.

4.6.2.4 North Las Vegas Airport

The North Las Vegas Airport (VGT) recently completed an Environmental Assessment for the construction of an Instrument Landing System (ILS) for Runway 12L in September 2003. This document identified only two future projects in the cumulative impacts evaluation. Both projects involved land acquisition for the development of aircraft storage hangars and other ground-based facilities. In the spring of 2005 the 12L ILS procedures were scheduled to be commissioned, however, they are still in process. Similarly, one of the land acquisition projects (Private Hangar Development) cited in the 2003 EA has been completed in 2005. The development of the other land acquisition project is currently in the design phase and entails a new taxiway, a paved access road, an aircraft parking apron, lighting, signage, and utility stub outs for future development.^{20,21}

These projects will be subject to a separate environmental review prior to construction as necessary. That environmental review will take into consideration any potential cumulative impacts resulting from that project as well as the Proposed Action described in this document, if applicable. Regardless, North Las Vegas Airport's proposed projects are independent of the approval or disapproval of this Supplemental Environmental Assessment and their nature is such that they are not likely to contribute to any cumulative impacts associated with the Proposed Action being evaluated in this document.

4.6.2.5 Nellis Air Force Base

In January 2005, Nellis Air Force Base (AFB) announced the availability of the Draft Environmental Assessment (EA) for proposed modifications to the Silver Military Operations Area (MOA). The Silver MOA is located in southeastern California, outside of the Study Area for the Proposed Action.

As stated in the Draft EA, the United States Air Force at Nellis AFB proposes to modify its existing special use airspace (the Silver MOA) in size and altitude to enhance realistic combat training at the National Training Center (NTC) at Fort Irwin, California and to improve aviation safety. If approved, the Silver MOA would be reconfigured to reduce its size in the southeast portion and increase its size in the southwest portion. These changes would result in a net reduction of special use airspace of approximately 215 square miles. The airspace no longer needed would be returned to the National Airspace System (NAS). Upon reconfiguration of the

²⁰ North Las Vegas Airport. On-line at <http://www.mccarran.com/>. Retrieved October 27, 2005.

²¹ *Final Environmental Assessment for the Proposed Construction and Operation of an Instrument Landing System (ILS), Runway 12L/30R, North Las Vegas Airport North Las Vegas, Nevada.* September 2003.

new special use airspace boundaries, the new airspace would be divided into two parts designated as 1) Silver North MOA and 2) Silver South MOA. The altitude ceiling of the Silver North MOA would be 9,000 feet above mean sea level (MSL) and the altitude ceiling of the Silver South MOA would be 7,000 feet MSL. Both MOAs would have an altitude floor of 200 feet above ground level (AGL).²²

The proposed modification to the Silver MOA is independent of the approval or disapproval of this Supplemental Environmental Assessment and its nature is such that it would not likely to contribute to any cumulative impacts associated with the Proposed Action being evaluated in this document.

4.6.3 Foreseeable Future Actions

This section describes foreseeable future development and improvement plans at LAS and at other airports located within the vicinity of LAS that are currently being studied or designed for possible future development.

4.6.3.1 Proposed Southern Nevada Regional Heliport

The Clark County Department of Aviation (CCDOA) was tasked by the Clark County Board of Commissioners to designate a new facility for the takeoff and landing of commercial helicopters in order to comply with the requirements of State of Nevada Revised Statutes, Chapter 495 (NRS 495). The primary role of this proposed Heliport would allow Clark County to comply with NRS 495 while maintaining their existing tourist service to the resorts, National Parks, and scenic sights in and around metropolitan Las Vegas.²³

In an effort to support commercial helicopter operations in a manner more compatible with existing and planned land uses in 2003, the State of Nevada amended NRS 495, requiring Clark County to designate a preferred non-urban heliport site no later than January 1, 2004. In addition, consistent with a long-standing CCDOA policy of encouraging general aviation activity to transition from McCarran International Airport to general aviation reliever airports (such as North Las Vegas and Henderson Executive Airports), a new Heliport would provide an alternative destination for commercial helicopter operations, and reserve limited airfield capacity at McCarran International Airport for its intended role within the Clark County aviation system. The planning criteria for a new Heliport would accommodate commercial helicopter operations, all tour operators, transit helicopters and training helicopters. This would total approximately 72 helicopters.²⁴

A proposed new 'Southern Nevada Regional Heliport' would provide a designated location for the voluntary basing of commercial helicopter operators at Las Vegas.

²² *Draft Environmental Assessment, Changing the Silver Military Operations Area for Nellis Air Force Base, Nevada*. Charis Professional Services Corporation. January 2005. On-line at: <http://www.nellis.af.mil/pa/documents/Silvermoa.pdf/>.

²³ Regional Heliport. On-line at www.mccarran.com/. Retrieved October 27, 2005.

²⁴ Regional Heliport. On-line at www.mccarran.com/. Retrieved October 27, 2005.

It was determined through a Needs Assessment for a proposed Heliport that the selection of a non-urban location is essential in order to comply with State Law NRS 495 and to ensure the long-term compatibility of commercial helicopter operations in Clark County with noise sensitive areas.²⁵

The proposed development of the Southern Nevada Regional Heliport is intended to support the Las Vegas and Grand Canyon tourism industry while remaining consistent with a long-standing CCDOA policy of encouraging general aviation activity to transition from LAS to general aviation reliever airports in the vicinity of Las Vegas. The proposed Southern Nevada Regional Heliport would provide an alternative destination for commercial helicopter operations, and reserve limited airfield capacity at LAS for its intended role within the Clark County aviation system.²⁶

A Needs Assessment and Site Suitability Assessment for the proposed Heliport were both completed in 2003.^{27,28} On May 5, 2004, the Board of County Commissioners authorized the Clark County Department of Aviation (CCDOA) to conduct an Environmental Assessment (EA) for the Southern Nevada Regional Heliport to assess the proposed development site for the Heliport, as well as alternative locations. The EA is nearing completion. If approved, the proposed Southern Nevada Regional Heliport would have a target operational date of 2008.²⁹ While it is reasonable to expect that the development of the heliport would draw most helicopter operations from LAS and thus provide some degree of noise relief in areas near McCarran International Airport, it is beyond the scope of this analysis to predict that change with any degree of precision. The EA for the heliport will quantify the specific noise changes associated with that project and its effects around LAS.

Development of the proposed Southern Nevada Regional Heliport is independent of the approval or disapproval of this Supplemental Environmental Assessment and its nature is such that it would not likely contribute to any cumulative impacts associated with the Proposed Action being evaluated in this document.

²⁵ *Needs Assessment for a Southern Nevada Regional Heliport*. Ricondo & Associates. November 3, 2003. On-line at: <http://www.mccarran.com/pdf/heliport/HeliportNeedsAssessment.pdf/>.

²⁶ *Needs Assessment for a Southern Nevada Regional Heliport*. Ricondo & Associates. November 3, 2003. On-line at: <http://www.mccarran.com/pdf/heliport/HeliportNeedsAssessment.pdf/>.

²⁷ *Needs Assessment for a Southern Nevada Regional Heliport*. Ricondo & Associates. November 2003. On-line at: <http://www.mccarran.com/pdf/heliport/HeliportNeedsAssessment.pdf/>.

²⁸ *Site Suitability Assessment for a Southern Nevada Regional Heliport*. Ricondo & Associates. December 2003. On-line at: <http://www.mccarran.com/pdf/heliport/SiteSuitabilityAssessment.pdf/>.

²⁹ Regional Heliport. On-line at: <http://www.mccarran.com/>. Retrieved October 27, 2005.

4.6.3.2 Proposed Future Supplemental Airport in Southern Nevada

The Clark County Department of Aviation is in the planning stages of developing a proposed future airport in southern Nevada, which would be designed as a second air carrier airport to serve the greater Las Vegas metropolitan area by supplementing available capacity at LAS.³⁰

Development of the proposed future supplemental airport in Southern Nevada is beyond the planning horizon of this Supplemental Environmental Assessment, is independent of the approval or disapproval of this Supplemental Environmental Assessment, and its nature is such that it would not likely contribute to any cumulative impacts associated with the Proposed Action being evaluated in this document.

4.6.4 Summary of Cumulative Impacts

The recently completed and planned future development projects at LAS and at airports in its vicinity would not impact or conflict with the Proposed Action. Beyond the planning horizon of this study (2010) there would be no foreseeable impacts other than those disclosed in this Supplemental Environmental Assessment.

The proposed Southern Nevada Regional Heliport and the proposed Supplemental Airport in Southern Nevada would acutely reduce aircraft operations at LAS and ultimately reduce aircraft noise in and around the vicinity of the airport.

Further, implementation of the STAAV 3 RNAV SID (the Proposed Action) would closely mimic the route of the OVETO SID (see **Exhibit 1.2**), which was in place prior to implementation of the Four Corner-Post Plan in October 2001. Additionally, since the implementation of the Four Corner-Post Plan eastbound traffic has been radar vectored along a flight path that closely resembles the Proposed Action flight path. As aircraft have always flown in the general vicinity of the proposed STAAV 3 RNAV SID flight path, implementation of the Proposed Action would not contribute to any cumulative impacts of past, present or foreseeable future actions.

³⁰ Clark County Department of Aviation. On-line at <http://www.mccarran.com/>. 2003.